REMARKS/ARGUMENTS

The present Amendment is in response to the Office Action having a mailing date of April 22 5, 2005. Claims 1-14 and 30-33 are pending in the present Application. Applicant has added claims 34-40. Consequently, claims 1-14 and 30-40 remain pending in the present Application.

Claims 1 and 14 have been amended to recite that the magnetic element(s) includes at least one layer and is configured to be written using spin transfer of charge carriers polarized by at least one layer having an in-plane magnetization. New claims 34 and 37 recite that particular ferromagnetic layers have an in-plane magnetization. Support for new claims 34 and 37 can be found in Figures 2, 3, 4A and 4B. New claims 35 and 38-40 recite the use of a free layer and a nonmagnetic capping layer. New claim 39 also recites that the free layer has a perpendicular anisotropy and that the nonmagnetic capping layer reduces this perpendicular anisotropy. Claim 40 recites specific materials for the free layer and the nonmagnetic capping layer. Support for the amendment can be found in Figure 2 (items 138 and 139) and the accompanying discussion (e.g. Specification, page 17, line 2-page 18, line 3. Claim 36 recites that the stress-assist layer is adjacent to and neither above nor below the magnetic element. Support for claim 36 can be found in Figure 2, items 130 and 140. Applicant respectfully submits that no new matter is added.

In the above-identified Office Action, the Examiner rejected claims 1-14 and 30-33 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,532,164 (Redon) in view of "Voltage Control of a Magnetization Easy Axis in Piezoelectric/ferromagnetic Hybrid Films" by Kim, et al. (Kim).

Applicant respectfully traverses the Examiner's rejection. Independent claims 1 and 14 recite a plurality of magnetic elements, each of which is "configured to be written using spin transfer of charge carriers polarized by at least one layer having an in-plane magnetization."

Claim 1 recites the use of "at least one stress-assist layer configured to exert at least one stress on at least one magnetic element of the plurality of magnetic elements during writing." Similarly, claim 14 recites the use of "at least one stress-assist layer configured to exert at least one stress on at least one magnetic element of the plurality of magnetic elements during writing, the stress-assist layer including at least one of a piezoelectric and an electrostrictive material." Thus, through the use of the stress-assist layer, switching of the magnetization of the magnetic element is facilitated. Specification, page 13, lines 7-20.

Although a stress assist layer is used, switching is accomplished using spin transfer of charge carriers polarized by at least one layer having an in-plane magnetization. In the embodiments depicted, the charge carriers may be polarized by the pinned layer(s) such as the pinned layers 133, 133', 210, and 256. Thus, the magnetic elements may, therefore, be switched without using an external applied field.

Redon describes a system that stores by driving a current through the magnetic tunnel junction. The device of Redon includes a ferromagnetic free layer, such as the ferromagnetic free layer 16 depicted in Figures 2, 3A and 3B. The devices of Redon also include a polarization layer, such as the layer 20 depicted in Figures 2, 3A and 3B. The polarization layer has its magnetization perpendicular to the plane of the layers and is used to polarize the moments of electrons traveling through the device of Redon. Redon, col. 4, lines 61-col. 5, line 14. Electrons traversing this layer and having their spins polarized by this layer when current is driven through the magnetic tunnel junction can be used to change the direction of magnetization of the free layer. Redon uses this layer to overcome the requirement of a large current. Redon, col. 2, lines 31-38 and col. 5, lines 31-37.

Kim describes a system that includes a trilayer of a piezoelectric layer, a magnetic layer, and a lead layer. Kim, page 2, bottom of the first column to top of second column (first full paragraph in the Experiments section). Kim also describes the need for obtaining "a sufficient electric field" between the electrodes and, therefore, a sufficient electrostrictive effect from the piezoelectric layer. Kim, page 2, second full paragraph (first paragraph in the Experiments section).

One of ordinary skill in the art would not be motivated to combine the teachings of Kim with those of Redon. As discussed above, Redon teaches that a small current density is desired to be used in the device. In contrast, Kim indicates that a "sufficient electric field" must be developed across the piezoelectric layer for the device of Kim to function. Consequently, one of ordinary skill in the art would not be motivated to combine the piezoelectric layer requiring a sufficient electric field with the device of Redon that is designed to require a lower current density. Applicant further submits that to combine the teachings of Kim with those of Redon is the result of improper hindsight. Applicant notes that one "cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." In re Fine, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988). See also In re Fritch, 23 USPQ2d 1780,1783 (Fed. Cir. 1992). Redon in view of Kim, therefore, fail to teach or suggest the magnetic memories recited in claims 1 and 14. Accordingly, Applicant respectfully submits that claims 1 and 14 are allowable over the cited references.

Claims 2-13, 30-31 and 34-37 depend upon independent claim 1. Claims 32-33 and 38 depend upon independent claim 14. Consequently, the arguments herein apply with full force to claims 2-13 and 30-38. Accordingly, Applicant respectfully submits that claims 2-13 and 30-38 are allowable over the cited references.

Claims 34-38 are also separately allowable over the cited references. Claims 34 and 37 recite that particular ferromagnetic layers have an in-plane magnetization. In particular, claim 34 recites that the layer polarizing the charge carriers has an in-plane magnetization. Similarly, claim 37 recites that all ferromagnetic layers have in-plane magnetizations.

Redon specifies that the device of utilizes a spin-polarizing layer that has a magnetization perpendicular to the layers. See, for example, Figures 2, 3A, and 3B of Redon. Consequently, Redon fails to teach or suggest the magnetic memories recited in claims 34 and 37. Even if it is assumed, *arguendo*, that one of ordinary skill in the art would combine Kim with Redon (a proposition with which Applicant does not agree), Kim merely teaches that the switchable layer has an in-plane magnetization and is covered by a piezoelectric layer. Consequently, any combination of Kim and Redon would still utilize the spin-polarizing layer having a magnetization perpendicular to the plane of the layers. Radon in view of Kim would thus fail to teach or suggest the magnetic memories recited in claims 34 and 37. Accordingly, Applicant respectfully submits that claims 34 and 37 are separately allowable over the cited references.

Claims 35 and 38-40 recite the use of a free layer and a non-magnetic capping layer. Claim 39 also recites that the free layer has a perpendicular anisotropy and that the nonmagnetic capping layer reduces this perpendicular anisotropy. Claim 40 recites specific materials for the free layer and the nonmagnetic capping layer. Applicant has found no mention in either Redon or Kim of the use of such a capping layer. Even if it is assumed, *arguendo*, that one of ordinary skill in the art would combine Kim with Redon (a proposition with which Applicant does not agree), any combination would still fail to utilize such a nonmagnetic capping layer. Redon in view of Kim thus fails to teach or suggest the use of such a nonmagnetic capping layer. Accordingly,

Applicant respectfully submits that claims 35 and 38-40 are separately allowable over the cited references.

Claim 36 recites that the at least one stress-assist layer adjacent to a portion of each of the plurality of magnetic elements without residing above or below any of the plurality of magnetic elements. Even if it is assumed, *arguendo*, that one of ordinary skill in the art would combine Kim with Redon (a proposition with which Applicant does not agree), Kim teaches that the piezoelectric material would lie on the magnetic layer to be switched. Consequently, the combination of Redon in view of Kim would place the piezoelectric material on the free layer. For example, the piezoelectric material would lie on (or possibly under) the free layer 16 in Fig. 2 of Redon. Thus, there is no stress assist layer that is adjacent to a portion of each of the plurality of magnetic elements without residing above or below any of the plurality of magnetic. Thus, Redon in view of Kim fails to teach or suggest the magnetic memory recited in claim 36. Accordingly, Applicant respectfully submits that claim 36 is allowable over the cited references.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

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